GIS as a Decision Support System-expert

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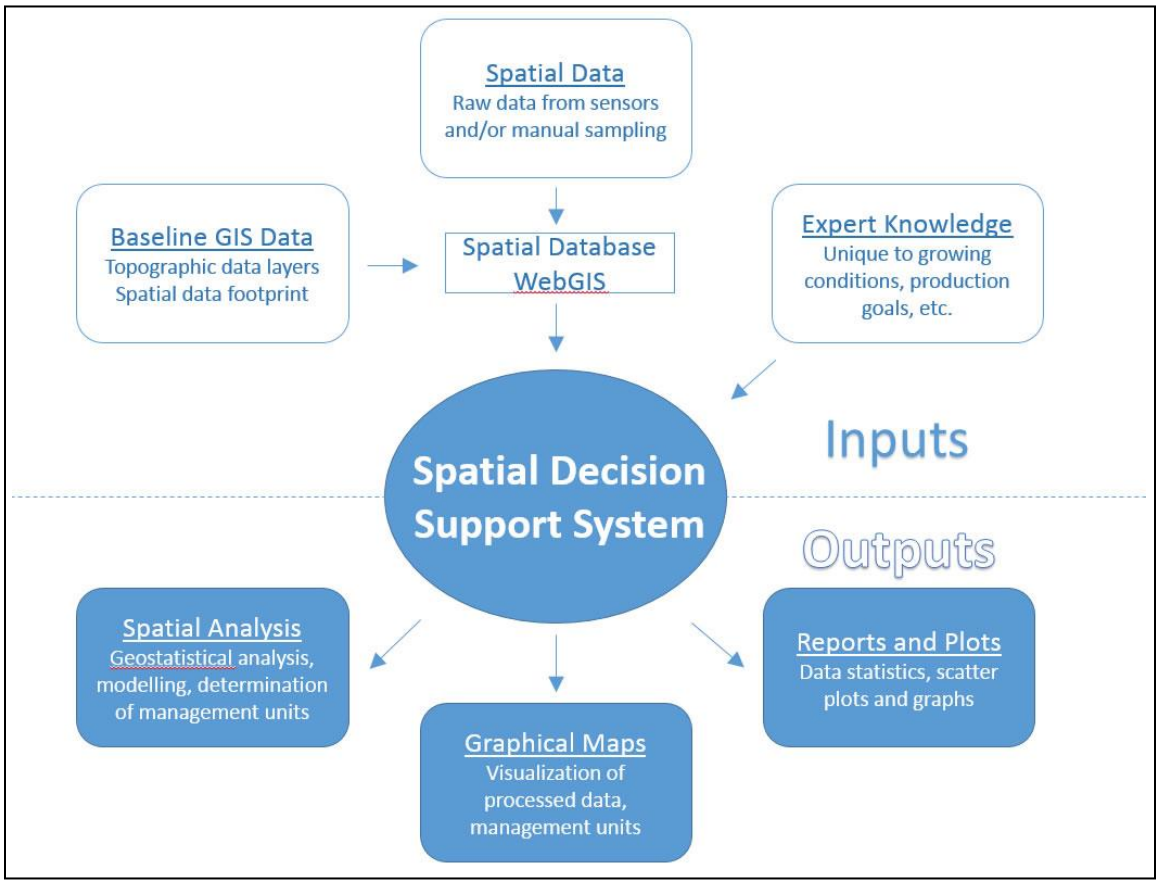
Introduction:

For more than three decades, computers have been used as tolls to support managerial decision making process. Some of the common computerized tools are Expert System (ES), Artificial Neural Network (ANN), and Decision Support System (DSS), and out of these the Decision Support System has found its use in GIS.

Decision Support System is computer based software, which supports in taking decisions for an ill-structured problem. It can be defined as follows:

"A DSS is an interactive, flexible and adaptable computer based information system, specially developed for supporting the solution of a particular ill-structured problem for improved decision making. It utilizes data provides easy user interface and it allows for the decision maker's own insights. Most sophisticated DSS also utilizes models the phases of the decision making and includes a knowledge base."



The main objectives of Decision Support Systems are:

(i) Effective generation of information on the decision problem from available data and ideas.

(ii) Effective generation of solutions (alternatives), and

(iii) To provide a good understanding of the structure and content of decision problem.

Characteristics of Decision Support System

In general, a decision support system requires an online access to data base through interactive programs and proper data communications. As the informational needs are not known, thus it requires an incremental design method. So in decision support system decision emphasizes its attention on decision making rather providing a simple information retrieval. Support highlights the role of computer as an aid and not as an replacement to the decision making, while system identifies the integrated nature of users, machine, and decision making environment.

The main characteristics of DSS are:

(i) To assist managers in their Decision Making Process for un-structured/semi-structured problems.

(ii) To support and enhance rather than replace managerial judgments.

(iii) To improve the use of models or analytical techniques with data access functions.

(iv) To emphasize flexibility and adaptability to respect changes in the context of decision making process and

(v) To focus on features, which make them easy to be used interactively by non-experienced users?

Supplementary characteristics of the DSS are:

(i) Enabling an intuitive approach towards a solution.

(ii) Helping in tentative procedures as they could be supported by fast proto type environment.

(iii) Including trial and error procedures and

(iv) Allowing the introduction of subjective judgments.

Architecture of a DSS

The conceptual architecture of a DSS can be explained through the following three different approaches.

(I) A functional approach

(II) A tool based approach

(III) A combined approach

Functional Approach

In functional approach, conceptual architecture is explained as combination of (a) language system (b) Knowledge system and (c) Problem processing system.

Language system deals with the basic interaction of computers and human beings. It deals with menus, command languages fill in form and natural language interface.

Tool Based Approach

In tools based approach, the architecture of a typical Dss contains a database, model base and dialogue module. In this approach user communicates through a dialogue module, which then accesses the database and the model to provide a solution.

A Combined Approach

In this approach the user interacts through a well defined user interface which sends requests to system controller. Depending upon the type to query, access to information to either database, model or a knowledge base is made.

Operational Structure of a DSS

The final product of finished DSS that accomplishes a task is called a specific DSS (SDSS). It is used to support a specific application for example indentifying wasteland in order to provide best possible routs within a given network of roads, etc.